


4

Histology

I. Definition and Classification of Tissues

 **Concept:** Histology is the specialty of anatomy that involves study of the microscopic structure of tissues. Tissues are assigned to four basic categories on the basis of their cellular composition and histological appearance.

A. Multiple Choice Questions

- ___ 1. Tissues are classified according to
 - (a) body region. (c) location in a specific organ.
 - (b) cellular life span. (d) cellular appearance and function.
- ___ 2. Knowledge of what constitutes normal tissue structure makes it easier for a pathologist to
 - (a) identify diseased tissue. (c) understand intercellular actions.
 - (b) understand organ functions. (d) practice staining techniques.
- ___ 3. Which tissue lines body cavities and blood vessels?
 - (a) epithelial tissue (c) muscle tissue
 - (b) connective tissue (d) nervous tissue
- ___ 4. The four principle kinds of tissues include all of the following *except*
 - (a) nervous tissue. (c) muscle tissue.
 - (b) cartilage tissue. (d) epithelial tissue.

B. True–False Questions

- ___ 1. Tissues are aggregations of similar cells that perform a particular function.
- ___ 2. Cells secrete a liquid matrix only.
- ___ 3. The outer layer of skin is mainly connective tissue.
- ___ 4. A tendon is composed mainly of connective tissue.

II. Developmental Exposition of Tissues


A. Multiple Choice Questions

- ___ 1. The single-layered outer wall of the morula eventually develops into
 - (a) the skin. (c) the placenta.
 - (b) the ectoderm. (d) the mesoderm.
- ___ 2. Which of the following is the last primary germ layer to form?
 - (a) endoderm (c) ectoderm
 - (b) mesoderm (d) hypodermis
- ___ 3. The outermost layer of the primary germ layer gives rise to
 - (a) the endometrium. (c) the muscles.
 - (b) the nervous system. (d) the lungs.

B. True–False Questions

- _____ 1. A zygote contains half the number of chromosomes as a gamete (sex cell).
- _____ 2. The trophoblast becomes a part of the placenta.
- _____ 3. Within the embryoblast, the slitlike space adjacent to the trophoblast is called the blastocyst cavity.
- _____ 4. Endoderm borders the blastocyst cavity.

III. Epithelial Tissue

 *Concept:* There are two major categories of epithelia: membranous and glandular. Membranous epithelia are located throughout the body and form such structures as the outer layer of the skin; the inner lining of body cavities, tubes, and ducts; and the covering of visceral organs. Glandular epithelia are specialized tissues that form the secretory portion of glands.


A. Multiple Choice Questions

- _____ 1. The flat cells of simple squamous epithelium are specialized for
 - (a) diffusion and filtration.
 - (b) secretion and lubrication.
 - (c) absorption in the GI tract.
 - (d) removal of dust in the respiratory system.
- _____ 2. Simple columnar epithelium is found in
 - (a) the digestive system.
 - (b) the uterine tubes.
 - (c) the respiratory system.
 - (d) the urinary system.
- _____ 3. Pseudostratified ciliated columnar epithelium is classified as simple epithelium because
 - (a) all cells are exposed to the surface.
 - (b) all cells have nuclei.
 - (c) it is ciliated with numerous goblet cells.
 - (d) each cell is in contact with the basement membrane.
- _____ 4. Keratinized stratified squamous epithelium is found in
 - (a) the oral cavity (mouth).
 - (b) the epidermis.
 - (c) the nasal cavity.
 - (d) the pharynx (throat).
- _____ 5. Transitional epithelium is characterized by
 - (a) its secretory functions.
 - (b) layers of flat cells.
 - (c) its ability to stretch.
 - (d) high mitotic activity.
- _____ 6. Which is true of a holocrine gland?
 - (a) It is a unicellular gland.
 - (b) The secretory product and part of the secretory cell are discharged.
 - (c) Only the secretory product is discharged.
 - (d) The secretory product and the entire secretory cell are discharged.

B. True–False Questions

- _____ 1. All of the cells of simple epithelia are in contact with the basement membrane and exposed to the surface.
- _____ 2. Epithelia can function as chemoreceptors.
- _____ 3. The stratum basale is the mitotically active layer of stratified squamous epithelium.
- _____ 4. Movement away from the layer of mitotic activity causes the cells of stratified squamous epithelium to dehydrate and flatten.
- _____ 5. The surface cells of stratified epithelium lining the oral cavity are dead.
- _____ 6. Exocrine glands secrete through ducts that always lead to the surface of the skin.

IV. Connective Tissue

 *Concept:* Connective tissue is divided into subtypes according to the matrix that binds the cells. Connective tissue provides structural and metabolic support for other tissues and organs of the body.

A. Multiple Choice Questions

- _____ 1. Fibroblasts are cells within connective tissue that produce
 - (a) collagenous fibers.
 - (b) elastic fibers.
 - (c) reticular fibers.
 - (d) all of the above.
- _____ 2. The connective tissue surrounding muscle fibers and muscle groups is called
 - (a) loose connective tissue.
 - (b) dense fibrous tissue.
 - (c) elastic connective tissue.
 - (d) reticular connective tissue.
- _____ 3. Tendons and ligaments receive their strength from
 - (a) tightly packed reticular fibers.
 - (b) loosely packed reticular fibers.
 - (c) tightly packed collagenous fibers.
 - (d) loosely packed collagenous fibers.
- _____ 4. The perichondrium is dense irregular connective tissue that surrounds
 - (a) bone.
 - (b) cartilage.
 - (c) muscle.
 - (d) organs.
- _____ 5. Fibrocartilage is found in
 - (a) intervertebral discs.
 - (b) the outer ear.
 - (c) the nose.
 - (d) the costal cartilage of the rib cage.
- _____ 6. Bone cells occupy spaces called
 - (a) osteocytes.
 - (b) canaliculi.
 - (c) lacunae.
 - (d) lamellae.
- _____ 7. The formed elements that function in the clotting of blood are called
 - (a) leukocytes.
 - (b) lymphocytes.
 - (c) erythrocytes.
 - (d) platelets.

B. True–False Questions


- _____ 1. Mesenchyme is connective tissue that can migrate.
- _____ 2. Mast cells aid in blood clotting.
- _____ 3. Weight loss as a result of dieting is actually elimination of adipose tissue.
- _____ 4. The cartilage between the two pelvic bones is the same kind that is present between the ribs and the sternum.
- _____ 5. Bone tissue consists of living cells and a mineralized matrix.
- _____ 6. The hardness of bone is due to collagenous fibers.

C. Matching Questions

Match the technical term on the left with its description on the right.

- | | |
|-----------------------------|-----------------------|
| _____ 1. chondrocytes | (a) red blood cells |
| _____ 2. leukocytes | (b) white fibers |
| _____ 3. elastic fibers | (c) platelets |
| _____ 4. thrombocytes | (d) white blood cells |
| _____ 5. erythrocytes | (e) bone cells |
| _____ 6. osteocytes | (f) yellow fibers |
| _____ 7. collagenous fibers | (g) cartilage cells |

V. Muscle Tissue

 *Concept:* Muscle tissue is responsible for the movement of materials through the body, the movement of one part of the body with respect to another, and for locomotion. Fibers in the three kinds of muscle tissue are adapted to contract in response to stimuli.


A. Multiple Choice Questions

- _____ 1. Intercalated discs are found in
 - (a) smooth muscle tissue.
 - (b) cardiac muscle tissue.
 - (c) skeletal muscle tissue.
 - (d) none of the above.
- _____ 2. Which is multinucleated?
 - (a) smooth muscle tissue
 - (b) cardiac muscle tissue
 - (c) skeletal muscle tissue
 - (d) none of the above

B. True–False Questions

- _____ 1. Muscle cells are elongated in the direction of contraction.
- _____ 2. Although smooth muscle is not striated, it is considered voluntary muscle.
- _____ 3. Skeletal muscle fibers are characterized by multiple nuclei and bifurcating (branching) fibers.

VI. Nervous Tissue

 *Concept:* Nervous tissue is composed of neurons, which respond to stimuli and conduct impulses to and from all body organs, and neuroglia, which functionally support and physically bind neurons.

A. Multiple Choice Questions

- ____ 1. Dendrites
 - (a) receive stimuli.
 - (b) interpret stimuli.
 - (c) conduct impulses away from the cell body.
 - (d) all of the above.

- ____ 2. Which structure contains a nucleus?
 - (a) dendrite
 - (b) axon
 - (c) nerve fiber
 - (d) cell body

B. True–False Questions

- ____ 1. A nerve fiber consists of several neurons in a series.
- ____ 2. Neuroglia are the basic units of the nervous system.
- ____ 3. Neuroglia are five times as abundant as neurons.
- ____ 4. Both neurons and neuroglia transmit nerve impulses.

VII. Clinical Considerations

A. Multiple Choice Questions

- ____ 1. The wasting of body tissue is called
 - (a) atrophy.
 - (b) dystrophy.
 - (c) hypertrophy.
 - (d) somatic death.

- ____ 2. Which tissue transplant involves genetically identical individuals?
 - (a) autograft
 - (b) allograft
 - (c) isograft
 - (d) xenograft

B. True–False Questions

- ____ 1. Necrosis is cellular death.
- ____ 2. A biopsy is the removal of a section of dead tissue for examination.

VIII. Chapter Review

A. Completion Questions

1. Tissue cells are separated and bound together by a nonliving intercellular _____ that the cells secrete.
2. Ectoderm, endoderm, and mesoderm constitute the _____ layers from which all body organs are derived.
3. All epithelia are bound to underlying supportive tissue by a _____ consisting of glycoprotein and collagenous and reticular fibers.
4. Simple squamous epithelium lining the lumina of blood vessels is referred to as _____, and that which covers visceral organs and lines body cavities is referred to as _____.
5. Mammary glands are classified as _____ according to their structure and as _____ according to mode of exocrine secretion.
6. _____ cells of columnar epithelia secrete mucus, which protects and lubricates the exposed surfaces of the luminal walls.
7. The protein _____ strengthens the exposed outer layer, or epidermis, of the skin.
8. Mast cells dispersed throughout loose connective tissue produce _____, an anticoagulant that prevents blood from clotting.
9. _____ are formed elements within the blood that help to combat inflammation and infection.
10. Neurons and _____ are the principle types of cells of which nervous tissue is composed.
11. Mitosis occurs principally in the stratum _____ of stratified squamous epithelium.
12. _____ glands secrete their products through ducts to the surface of an organ.
13. Connective tissue proper has a loose, flexible matrix, frequently called _____.
14. Undifferentiated embryonic connective tissue called _____ migrates to predisposed sites, where it participates in forming organs.
15. The retention of excessive tissue fluid may result in a swollen condition called _____.
16. Chondrocytes and osteocytes occupy spaces called _____ within the matrix of their respective tissues.
17. Cardiac muscle tissue contains _____ that help to hold adjacent cells together and transmit the force of contraction from cell to cell.
18. An axon of a neuron and its associated myelin sheath is referred to as a _____.